CLAIMS

1. A router (108) in an Internet Protocol, IP, based UMTS Terrestrial Radio Access Network, UTRAN, Transport Network (106) within a Universal Mobile Telecommunication System, the UTRAN transport network (106) carries Dedicated Channel (DCH) frames on DCHs between a RNC (102) and at least one Node B (104), **characterised in** that the router (108) comprises means for splitting one DCH traffic flow into at least two DCH traffic flows by using an IP multicast protocol.

2. The router according to claim 1, wherein the router comprises means for replicating each DCH frame and means for transmitting the replicated DCH frames according to the IP multicast protocol.

3. The router according to any of claims 1-2, wherein the IP multicast protocol is Core Based Trees Multicast Routing version 2,CBTv2.

4. The router according to any of claims 1-2, wherein the IP multicast protocol is Protocol Independent Multicast-Sparse Mode, PIM-SM.

5. The router according to any of claims 1-4, wherein each DCH traffic flow is assigned a dedicated multicast destination address in one or more of the Node Bs.

6. The router according to any of claims 1-5, wherein the means for splitting further comprises means for identifying a mapping between the RNC and the multicast destination address by using CBTv2 or PIM-SM bootstrap mechanism.

7. The router according to any of claims 1-6, wherein the router comprises means for determining whether the router is a splitting and/or combination router by using the protocol(s) CBTv2 and/or MLD, wherein the protocol(s) are/is arranged to determine the number of listeners for a specific multicast destination address.

8. The router according to any of claims 1-6, wherein the router comprises means for determining whether the router is a splitting and/or combination router by using the protocol(s) PIM-SM and/or MLD wherein the protocol(s) are/is arranged to determine the number of listeners for a specific multicast destination address.

9. The router according to any of claims 1-6, wherein the router comprises means for determining whether the router is a splitting and/or combination router by using the protocol(s) PIM-SM and/or Internet Group Management Protocol, IGMP, wherein the protocol(s) are/is arranged to determine the number of listeners for a specific multicast destination address.

10. The router according to any of claims 1-6, wherein the router comprises means for determining whether the router is a splitting and/or combination router by using the protocol(s) CBTv2 and/or Internet Group Management Protocol, IGMP, wherein the protocol(s) are/is arranged to determine the number of listeners for a specific multicast destination address.

11. The router according to any of claims 1-10, wherein the router comprises means for identifying DCH frames belonging to different uplink DCH traffic flows by means of utilisation of the multicast address, assigned as the downlink destination address, as the source address of the DCH frames sent in the uplink DCH traffic flows from all participating Node Bs.

12. The router according to any of claims 1-10, wherein the router comprises means for identifying DCH frames belonging to different uplink DCH traffic flows by retrieving the destination address and the destination port(s) of the uplink flows from the RNC.

13. The router according to any of claims 1-10, wherein the router comprises means for identifying DCH frames belonging to different uplink DCH traffic flows by using an uplink flow identity implicit in the downlink DCH traffic flow.

14. The router according to any of claims 1-10, wherein the router comprises means for identifying DCH frames belonging to different uplink DCH traffic flows by modifying the MLD or IGMP protocol and the multicast routing

protocol such that the destination port of the uplink is included in the messages that are used to build the multicast tree.

15. The router according to any of claims 1-14, wherein the router comprises means for combining at least two uplink DCH traffic flows into one single uplink DCH traffic flow.

16. The router according to claim 15, wherein the means for combining comprises further means for building a new DCH frame from a received set of DCH frames in the at least two uplink DCH traffic flows to be combined, encapsulating the new DCH frame in a UDP packet and sending the UDP packet in the uplink direction.

17. The router according to claim 16, wherein the means for building the new DCH frame from a received set of DCH frames to be combined comprises further means for including a selected set of Transport Blocks, TBs, in the payload of the new DCH frame, copying the header of the received DCH frames to the new DCH frame, selecting a Quality Estimate, QE, value for the new DCH frame and, if a payload CRC is used, calculating a payload CRC for the new DCH frame.

18. The router according to any of claims 1-17, wherein the router comprises means for estimating a Latest Accepted Time of Arrival ,LAToA, for a next set of DCH frames to be combined having a Connection Frame Number$_n$, CFN_n, based on the times of arrival of the previous set of frames having a CFN_{n-1}, means for adjusting the estimates of the LAToA for each new frame adapted to the maximum transport delay that a frame can experience under normal circumstances on its path from the Node B to the combining router.

19. A method in an Internet Protocol, IP, based UMTS Terrestrial Radio Access Network, UTRAN, Transport Network within a Universal Mobile Telecommunication System, the UTRAN transport network carries Dedicated Channel (DCH) frames on DCHs between a RNC and at least one Node B, the method is **characterised in** that it comprises the step of:

-*splitting* one DCH traffic flow into at least two DCH traffic flows by using an IP multicast protocol.

20. The method according to claim 19, comprises the further steps of:

-*replicating* each DCH frame and

-*transmitting* the replicated DCH frames according to the IP multicast protocol.

21. The method according to any of claims 19-20, wherein the IP multicast protocol is Core Based Trees Multicast Routing version 2,CBTv2.

22. The method according to any of claims 19-20, wherein the IP multicast protocol is Protocol Independent Multicast-Sparse Mode, PIM-SM.

23. The method according to any of claims 19-22, wherein each DCH traffic flow is assigned a dedicated multicast destination address in one or more of the Node Bs.

24. The method according to any of claims 19-23, comprises the further step of:
-*identifying* a mapping between the RNC and the multicast destination address by using CBTv2 or PIM-SM bootstrap mechanism.

25. The method according to any of claims 19-24, comprises the further step of:

-*determining* whether the router is a splitting and/or combination router by using the protocol(s) CBTv2 and/or MLD, wherein the protocol(s) are/is arranged to determine the number of listeners for a specific multicast destination address.

26. The method according to any of claims 19-24, comprises the further step of:

-*determining* whether the router is a splitting and/or combination router by using the protocol(s) PIM-SM and/or MLD wherein the protocol(s) are/is arranged to determine the number of listeners for a specific multicast destination address.

27. The method according to any of claims 19-24, comprises the further step of:

-*determining* whether the router is a splitting and/or combination router by using the protocol(s) PIM-SM and/or Internet Group Management Protocol, IGMP, wherein the protocol(s) are/is arranged to determine the number of listeners for a specific multicast destination address.

28. The method according to any of claims 19-24, comprises the further step of:

-*determining* whether the router is a splitting and/or combination router by using the protocol(s) CBTv2 and/or Internet Group Management Protocol, IGMP, wherein the protocol(s) are/is arranged to determine the number of listeners for a specific multicast destination address.

29. The method according to any of claims 19-28, comprises the further step of:
-*identifying* DCH frames belonging to different uplink DCH traffic flows by means of utilisation of the multicast address, assigned as the downlink destination address, as the source address of the DCH frames sent in the uplink DCH traffic flows from all participating Node Bs.

30. The method according to claim 29, comprises the further step of:

-*identifying* an originating Node B of an uplink DCH frame, based on a destination IP address and a destination UDP port assigned by the RNC to the Node B for the uplink of the DCH.

31. The method according to any of claims 19-28, comprises the further step of:
-*identifying* DCH frames belonging to different uplink DCH traffic flows by retrieving the destination address and the destination port(s) of the uplink DCH traffic flows from the RNC.

32. The method according to any of claims 19-28, comprises the further step of:
-*identifying* DCH frames belonging to different uplink DCH traffic flows by using an uplink flow identity implicit in the downlink flow.

33. The method according to any of claims 19-28, comprises the further step of:
-*identifying* DCH frames belonging to different uplink DCH traffic flows by modifying the MLD or IGMP protocol and the multicast routing protocol such that the destination port of the uplink is included in the messages that are used to build the multicast tree.

34. The method according to any of claims 29, 31, 32 or 33, comprises the further step of:

-identifying an originating Node B of an uplink DCH frame, based on a source UDP port assigned by the RNC to the Node B for the uplink of the DCH.

35. The method according to any of claims 31-33, comprising the further step of:

-identifying an originating Node B of an uplink DCH frame, based on a source IP address.

36. The method according to any of claims 19-35, comprises the further step of:

-combining at least two uplink DCH traffic flows into one uplink DCH traffic flow.

37. The method according to claim 36, comprises the further steps of:

-building a new DCH frame from a received set of DCH frames in the at least two uplink DCH traffic flows to be combined,

-encapsulating the new DCH frame in a UDP packet and

-sending the UDP packet in the uplink direction.

38. The method according to claim 37, wherein the building step comprises the further steps of:

-including a selected set of Transport Blocks, TBs, in the payload of the new DCH frame,

-copying the header of the received DCH frames to the new DCH frame,

-selecting a Quality Estimate, QE, value for the new DCH frame and, if a payload CRC is used,

-calculating a payload CRC for the new DCH frame.

39. The method according to any of claims 19-38, comprises the further steps of:

-estimating a Latest Accepted Time of Arrival ,LAToA, for a next set of DCH frames to be combined having a Connection Frame Number$_n$, CFN_n, based on the times of arrival of the previous set of frames having a CFN_{n-1}, and

-*adjusting* the estimates of the LAToA for each new frame adapted to the maximum transport delay that a frame can experience under normal circumstances on its path from the Node B to the combining router.

40. A computer program product directly loadable into the internal memory of a computer within a node in a Universal Mobile Telecommunication System, comprising the software code portions for performing the steps of any of claims 19-39.

41. A computer program product stored on a computer usable medium, comprising readable program for causing a computer, within a node in a Universal Mobile Telecommunication System to control an execution of the steps of any of the claims 19-39.